REMARKS

The Applicant respectfully requests further examination and consideration in view of the arguments set forth fully below. Prior to this Office Action, Claims 1, 3-6, 9-19, 22-28, 30-33, and 36-60 were pending in this application. Within the Office Action, Claims 1, 3-6, 9, 15-19, 22, 28, 30-33, 36, 42-44, 46-50, 52-56, and 58-60 are rejected, and Claims 10-14, 23-27, 37-41, 45, 51, and 57 are objected to. Accordingly, Claims 1, 3-6, 9-19, 22-28, 30-33, and 36-60 are currently pending in this application.

Rejections Under 35 U.S.C. § 103

Within the Office Action, Claims 1, 3, 15, 16, 22, 28, 30, 31, 36, 42-44, 46-50, 52-56, and 58-60 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,353,617 to Cadd et al. (hereinafter "Cadd") in view of U.S. Patent No. 5,892,769 to Lee. The Applicant respectfully traverses these rejections.

The present invention is directed to a wireless network that utilizes a central hub and a number of end user nodes (EUNs). A downstream direction is well known in the art and defines a direction from the hub to the EUN. In the downstream direction, the communication channel is a broadcasting channel. In other words, any signal sent by the hub is received by every EUN within range of the hub. An upstream direction is also well known in the art and defines a direction from the EUN to the hub. The upstream communication channel is divided into time slots and is shared by many EUNs. As each time slot is available to many EUNs, contention between the EUNs exists for access to the time slots. The time slots are therefore also referred to as contention slots. Since only one EUN is allowed to transmit at a time, EUN transmission for each contention slot is coordinated using a contention mode or a request and grant mode. Each of these contention mechanisms, the contention mode and the request and grant mode, enable the contention slots to be used for upstream communication, that is from the EUN to the hub (Present Specification, page 5, lines 7-12).

The present invention allocates a queue in a weighted fair queue to generate contention slots, where each contention slot is designated for either the request and grant mode or the contention mode. Idle end user nodes (EUNs) utilize a contention slot designated for contention mode to request access. All EUNs are grouped into virtual groups, and an upstream (from EUN to a hub) contention mode contention slot is announced to all EUNs within a given virtual group

via a grant from the hub using a multicast addressing mode. If a collision occurs between two idle end user nodes requesting access using the contention slot designated for contention mode, two new contention slots designated for request and grant mode are generated, and the newly generated slots are placed in the weighted fair queue. The previously idle EUNs are now considered active EUNs, where each active EUN utilizes a request and grant contention slot.

The number of contention slots designated for request and grant mode increases and decreases according to the number of EUN access requests. However, the number of contention slots designated for contention mode remains a fixed, constant number. In the preferred case, the number of contention mode contention slots is one. In this case, the number of request and grant mode contention slots will vary based on the number of access requests, but the number of contention mode contention slots remains fixed at one.

Cadd is directed to a random access system in which an end user communicates with a central controller. A frame structure is defined in which communications are organized and transmitted over the random access system using a series of frames. Each frame, such as frame 28 and frame 30 in Figure 1 of Cadd, include a control slot 20, and a series of contention slots 24. The control slot 20 is allocated in each frame to provide call setups and other outgoing information from the central controller (Cadd, col. 3, lines 11-14). In other words, the control slot 20 provides communication in the downstream direction from the central controller to the end user. Therefore, control slot 20 is not a contention slot. This conclusion is further substantiated in Cadd since "contention" slots 24 are explicitly differentiated from "control" slot 20.

Within the Office Action, it is stated that Cadd teaches allocating a first number of contention slots according to a request and grant mode, and allocating a second number of contention slots according to a contention mode. To support this assertion, it is stated that "contention slot 1" in frame 28 is allocated in the contention mode, and that "contention slots 2 to slots 50" are allocated in the request and grant mode. The Applicant is unsure as to the designations used within the Office Action, as there is no reference to a "contention slot 1" or "contention slots 2 to slots 50" in Cadd. There are two possible interpretations for these designations. First, "contention slot 1" refers to the "data 1" slot within contention slots 24 of frame 28 (Figure 1 of Cadd) and that "contention slots 2 to slots 50" refer to "data 2" to "data 50" slots within contention slots 24. Second, "contention slot 1" refers to control slot 20 and "contention slots 2 to slots 50" refers to "data 2" to "data 50" slots within contention slots 24. Each of these two possible interpretations are addressed below.

In regard to the first interpretation, there is no hint. teaching, or suggestion within Cadd that suggests the contention slots 24 (which the Examiner refers to as contention slots 1-50) are allocated in two, one for request and grant mode and the other for contention mode. Cadd specifically teaches that each contention slot 24 is allocated according to the contention mode (Cadd, col. 3, lines 32-34). Cadd does not teach that any of the contention slots 24 function in the request and grant mode. Therefore, Cadd does not teach allocating a first number of contention slots according to a request and grant mode, as claimed.

In regard to the second interpretation, it is stated within the Office Action that control slot 20 is a contention slot that is allocated according to the request and grant mode. To support this assertion, column 3, lines 10-15 of Cadd is cited, which teaches call setup via the control slot 20. However, as discussed above, the control slot 20 is not a contention slot. Therefore, Cadd does not teach allocating a first number of contention slots according to a request and grant mode, as claimed.

In summary, Cadd teaches a control slot 20 and contention slots 24 (labeled as "data 1" through "data 50" in Figure 1 of Cadd), where the contention slots (contention slots 24) are exclusively allocated according to a contention mode. Cadd does not teach allocating a contention slot according to a request and grant mode due in part because control slot 20 is not a "contention slot" (Applicant also separately contends that control slot 20 does not operate in the "request and grant mode" as is well known in the art). Further, Lee is not cited for teaching the claimed limitations of allocating a first number of contention slots according to a request and grant mode and allocating a second number of contention slots according to a contention mode. Therefore, neither Cadd, Lee, nor their combination teach the claimed limitations of allocating a first number of contention slots according to a request and grant mode and allocating a second number of contention slots according to a contention mode.

The independent Claim 1 is directed to a method of integrating a scheduling algorithm in a wireless network shared by a plurality of users. The method includes generating one or more contention slots, allocating a first number of contention slots according to a request and grant mode, wherein the first number is determined by a number of user access requests, further wherein each one of the number of user access requests corresponds to a different one of the first number of contention slots, allocating a second number of contention slots according to a contention mode, prioritizing the first number of contention slots and the second number of contention slots, and dynamically adjusting the first number of contention slots according to a change in the number of users requesting access. As discussed above, neither Cadd, Lee, nor

their combination teach allocating a first number of contention slots according to a request and grant mode and allocating a second number of contention slots according to a contention mode. For at least these reasons, the independent Claim 1 is allowable over Cadd in view of Lee.

Claims 3, 42-44, and 46-47 are dependent on the independent Claim 1. As discussed above, Claim 1 is allowable over the teachings of Cadd in view of Lee. Accordingly, Claims 3, 42-44, and 46-47 are each also allowable as being dependent upon an allowable base claim.

The independent Claim 15 is directed to an apparatus for integrating a scheduling algorithm in a wireless network shared by a plurality of users. The apparatus includes means for generating one or more contention slots, means for allocating a first number of contention slots according to a request and grant mode, wherein the first number is determined by a number of user access requests, further wherein each one of the number of user access requests corresponds to a different one of the first number of contention slots, means for allocating a second number of contention slots according to a contention mode, means for prioritizing the first number of contention slots and the second number of contention slots, and means for dynamically adjusting the first number of contention slots according to a change in the number of users requesting access. As discussed above, neither Cadd, Lee, nor their combination teach allocating a first number of contention slots according to a request and grant mode and allocating a second number of contention slots according to a contention mode. For at least these reasons, the independent Claim 15 is allowable over Cadd in view of Lee.

Claims 16, 22, 48-50, and 52-53 are dependent on the independent Claim 15. As stated above, Claim 15 is in a condition for allowance. Accordingly, Claims 16, 22, 48-50, and 52-53 are each also allowable as being dependent upon an allowable base claim.

The independent Claim 28 is directed to an apparatus for integrating a scheduling algorithm in a wireless network channel shared by a plurality of users. The apparatus includes a hub for transmitting and receiving wireless network signals such that the hub may receive requests and assign portions of a communication bandwidth, a plurality of end user nodes for transmitting and receiving wireless network signals such that a plurality of users may request or be granted a portion of the communication bandwidth, and a weighted fair queue for utilizing an adaptive contention scheduling scheme to generate one or more contention slots, to allocate a first number of contention slots according to a request and grant mode, wherein the first number is determined by a number of user access requests, each one of the number of user access requests corresponds to a different one of the first number of contention slots, to allocate a second number of contention slots according to a contention mode, to prioritize the first number

of contention slots and the second number of contention slots, and to dynamically adjusting the first number of contention slots according to a change in the number of active users requesting access, and according to the number of idle users requesting access via the contention mode. As discussed above, neither Cadd, Lee, nor their combination teach allocating a first number of contention slots according to a request and grant mode and allocating a second number of contention slots according to a contention mode. For at least these reasons, the independent Claim 28 is allowable over Cadd in view of Lee.

Claims 30, 31, 36, 54-56, and 58-60 are dependent on independent Claim 28. As stated above, Claim 28 is in a condition for allowance. Accordingly, Claims 30, 31, 36, 54-56, and 58-60 are also in a condition for allowance.

Within the Office Action, Claims 4-6, 17-19, and 31-33 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Cadd in view of Lee and further in view of U.S. Patent No. 6,381,228 to Prieto, Jr. et al. (hereinafter "Prieto"). The Applicant respectfully traverses these rejections.

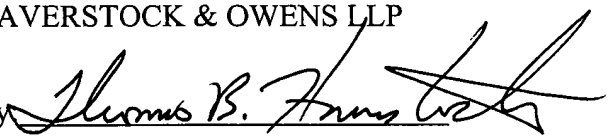
Claims 4-6 are dependent on independent Claim 1. Claims 17-19 are dependent on independent Claim 15. Claims 31-33 are dependent on independent Claim 28. As stated above, Claims 1, 15, and 28 are in a condition for allowance. Accordingly, Claims 4-6, 17-19, and 31-33 are each also allowable as being dependent upon an allowable base claim.

Within the Office Action, it is stated that Claims 10-14, 23-27, 37-41, 45, 51, and 57 are objected to as being dependent upon a rejected base claim, but would be allowable of rewritten in independent form including all the limitations of the base claim and any intervening claims.

For the reasons given above, Applicant respectfully submits that the claims are in a condition for allowance, and allowance at an early date would be appreciated. Should the Examiner have any questions or comments, the Examiner is encouraged to call the undersigned at (408) 530-9700 to discuss the same so that any outstanding issues can be expeditiously resolved.

Respectfully submitted,
HAVERSTOCK & OWENS LLP

Dated: 7-18-05

By 

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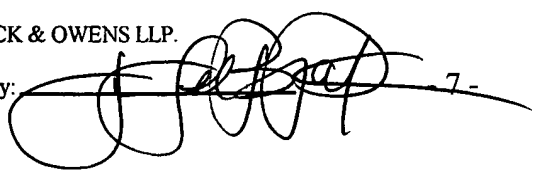
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